

CLAIMS

## I Claim:

1. A method of processing a plurality of multi-bit words that are used to operate a device, the method comprising:
  - identifying one or more of bits of the multi-bit words as "Don't Care" bits that do not affect the functionality of the device; and
  - performing a compression operation on the multi-bit words thereby creating a compressed data set, wherein the compression operation uses the identified "Don't Care" bits during the compression operation.
2. The method of Claim 1, wherein the compression operation comprises:
  - maintaining a compression buffer of previously compressed multi-bit words; and
  - comparing multi-bit words to be compressed with the multi-bit words in the compression buffer, wherein the "Don't Care" bits are deemed to result in matches during the comparing.
3. The method of Claim 1, wherein the step of performing the compression operation comprises using a Lempel-Ziv compression algorithm.
4. The method of Claim 1, wherein the device is a programmable logic device, and the step of identifying the one or more "Don't Care" bits comprises identifying architectural "Don't Care" bits of the programmable logic device.
5. The method of Claim 1, wherein the device is a programmable logic device, and the step of identifying the one or more "Don't Care" bits comprises identifying design "Don't Care" bits of the programmable logic device.

6. The method of Claim 1, wherein the device is a programmable logic device, and the step of identifying the one or more "Don't Care" bits includes examining a design of the programmable logic device, and identifying configuration bits associated with unused logic in the programmable logic device as "Don't Care" configuration bits.

7. The method of Claim 1, further comprising providing a mask value associated with each of the multi-bit words, wherein each mask value identifies the location of any "Don't Care" bits in the associated multi-bit word.

8. The method of Claim 1, wherein the steps of identifying the "Don't Care" bits and performing the compression operation are implemented by a computer system external to the device.

9. The method of Claim 1, further comprising storing the compressed data set in a non-volatile memory.

10. The method of Claim 1, further comprising:  
decompressing the compressed data set on the device,  
thereby creating a decompressed data set; and  
loading the decompressed data set into the device.

11. The method of Claim 10, wherein the decompressed data set is not identical to the plurality of multi-bit words.

12. The method of Claim 1, wherein the step of identifying the one or more "Don't Care" bits comprises:  
identifying bits that are "Don't Care" bits  
regardless of a configuration of the device; and  
identifying "Don't Care" bits that are dependent on  
the configuration of the device.

13. A system for processing a plurality of multi-bit words that are used to operate a device, the system comprising:  
means for identifying one or more of bits of the multi-bit words as "Don't Care" bits that do not affect the functionality of the device; and  
means for performing a compression operation on the multi-bit words thereby creating a compressed data set, wherein the compression operation uses the identified "Don't Care" bits during the compression operation.

14. The system of Claim 13, wherein the means for performing a compression operation comprises:  
a compression buffer configured to store previously compressed multi-bit words; and  
a comparator configured to compare multi-bit words to be compressed with the multi-bit words in the compression buffer, while applying the "Don't Care" bits associated with the multi-bit words to be compressed.

15. The system of Claim 13, wherein the means for performing a compression operation comprises a Lempel-Ziv compression circuit.

16. The system of Claim 13, wherein the means for identifying the "Don't Care" bits comprises means for generating mask values associated with each of the multi-bit words, wherein each mask value identifies the location of any "Don't Care" bits in the associated multi-bit word.

17. The system of Claim 13, wherein the means for identifying the "Don't Care" bits and the means for performing the compression operation comprise a computer system external to the device.

18. The system of Claim 13, further comprising a means for storing the compressed data set.

19. The system of Claim 13, further comprising a decompression circuit located on the device, wherein the decompression circuit is configured to decompress the compressed data set, thereby creating a decompressed data set.

20. The system of Claim 19, wherein the device is a programmable logic device, the system further comprising configuration logic located on the programmable logic device, wherein the configuration logic is configured to load the decompressed data set into a configuration memory of the programmable logic device.

21. The system of Claim 19, wherein at least one of the identified "Don't Care" bits of the plurality of multi-bit words differs from the corresponding bit in the decompressed data set.

22. A method of reducing the size of a data set, the method comprising:

dividing the data set into a plurality of multi-bit words

identifying one or more of the bits of the multi-bit words as "Don't Care" bits that are not required by a user of the data set; and

performing a compression operation on the multi-bit words thereby creating a compressed data set, wherein the compression operation uses the identified "Don't Care" bits during the compression operation.

23. The method of Claim 22, wherein the "Don't Care" bits comprise one or more uninitialized fields.

24. The method of Claim 22, wherein the compression operation comprises:

maintaining a compression buffer of previously compressed multi-bit words; and

comparing multi-bit words to be compressed with the multi-bit words in the compression buffer, wherein the "Don't Care" bits are deemed to result in matches during the comparing.

25. The method of Claim 22, wherein the step of performing the compression operation comprises using a Lempel-Ziv compression algorithm.

26. The method of Claim 22, further comprising providing a mask value associated with each of the multi-bit words, wherein each mask value identifies the location of any "Don't Care" bits in the associated multi-bit word.

27. The method of Claim 22, further comprising:  
decompressing the compressed data set, thereby creating a decompressed data set; and  
using the decompressed data set in a function associated with the data set.

28. The method of Claim 27, wherein the decompressed data set is not identical to the data set.

29. A system for reducing the size of a data set, the system comprising:

means for dividing the data set into a plurality of multi-bit words

means for identifying one or more of the bits of the multi-bit words as "Don't Care" bits that are not required by a user of the data set; and

means for performing a compression operation on the multi-bit words thereby creating a compressed data set, wherein the compression operation uses the identified "Don't Care" bits during the compression operation.

30. A method of reducing the size of a data set, the method comprising:

dividing the data set into a plurality of records, each of the records having one or more fields;

identifying one or more of the fields as uninitialized fields that do not contain useful information; and

performing a compression operation on the data set, thereby creating a compressed data set, wherein the compression operation uses the identified uninitialized fields during the compression operation.

31. A system for processing a data set with a plurality of records, each of the records having one or more fields, the system comprising:

means for identifying one or more uninitialized fields in the data set; and

means for performing a compression operation on the data set, thereby creating a compressed data set, wherein the compression operation uses the identified uninitialized fields during the compression operation.